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INSTITUTION New South Wales Dept. of Education, Sydney (Australia).

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ABSTRACT

As part of a series of tests to measure mastery of specific skills in the natural sciences, copies of the first 13 tests are provided. Skills to be tested include: (1) reading a table; (2) using a biological key; (3) identifying chemical symbols; (4) identifying parts of a human body; (5) reading a line graph; (6) identifying electronic and electrical symbols; (7-8) naming laboratory apparatus; (9-10) identifying the bones of the human skeleton by technical and common names; (11) naming the branches of science; (12) converting metric mass; and (13) identifying hazards in a laboratory. The multiple choice questions were written for students in grades 7 through 10. Teachers' notes and scoring information are provided for each test. (CM)

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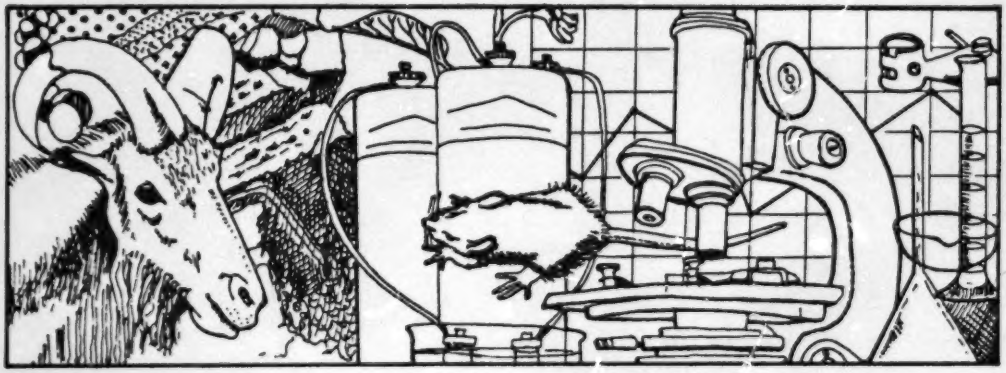
M1

New South Wales **Department of Education**

SCIENCE

MASTERY TESTING PROGRAMME



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TEST M1 : A TEST FOR
THE SKILL OF
READING A TABLE

TM 820 309

Use this table to answer the questions on the next page.

Dry Bulb Temp.	RELATIVE HUMIDITY OF AIR														
	DIFFERENCE BETWEEN WET AND DRY BULB TEMP. (°C)														
(°C)	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°
0	81	64	46	29	13										
1	83	66	49	33	17										
2	84	68	52	37	22	7									
3	84	70	55	40	26	12									
4	85	71	57	43	29	16									
5	86	72	58	45	33	20	7								
6	86	73	60	48	35	24	11								
7	87	74	62	50	38	26	15								
8	87	75	63	51	40	29	19	8							
9	88	76	64	53	42	32	22	12							
10	88	77	66	55	44	34	24	15	6						
11	89	78	67	56	46	36	27	18	9						
12	89	78	68	58	48	39	29	21	12						
13	89	79	69	59	50	41	32	23	15	7					
14	90	79	70	60	51	42	34	26	18	10					
15	90	80	71	61	53	44	36	27	20	13	6				
16	90	81	71	63	54	46	38	30	23	15	8				
17	90	81	72	64	55	47	40	32	25	18	11				
18	91	82	73	65	57	49	41	34	27	20	14	7			
19	91	82	74	65	58	50	43	36	29	22	16	10			
20	91	83	74	66	59	51	44	37	31	24	18	12	6		
21	91	83	75	67	60	53	46	39	32	26	20	14	9		
22	92	83	76	68	61	54	47	40	34	28	22	17	11	5	
23	92	84	76	69	62	55	48	42	36	30	24	19	13	8	
24	92	84	77	69	62	56	49	43	37	31	26	20	15	10	5
25	93	84	77	70	63	57	50	44	39	33	28	22	17	12	8
26	92	85	78	71	64	58	51	46	40	34	29	24	19	14	10
27	92	85	78	71	65	58	52	47	41	36	31	26	21	16	12
28	93	85	78	72	65	59	53	48	42	37	32	27	22	18	13
29	93	86	79	72	66	60	54	49	43	38	33	28	24	19	15
30	93	86	79	73	67	61	55	50	44	39	35	30	25	21	17
31	93	86	80	73	67	61	56	51	45	40	36	31	27	22	18
32	93	86	80	74	68	62	57	51	46	41	37	32	28	24	20
33	93	87	80	74	68	63	57	52	47	42	38	33	29	25	21
34	93	87	81	75	69	63	58	53	48	43	39	35	30	28	23
35	94	87	81	75	69	64	59	54	49	44	40	36	32	28	24

A "wet and dry bulb thermometer" is used to measure humidity. The "wet bulb" has wet cotton wool around it, and the "dry bulb" has nothing. To measure humidity, you do this:

1. Read the dry bulb thermometer and write down the temperature.

2. Read the wet bulb thermometer and write down the DIFFERENCE between the two thermometers.

3. Use the relative humidity table opposite to find the humidity.

Use the table to find the answer which fits into the blank space and mark the letter (A, B, C or D) for that question on your answer sheet.

Question	Dry Bulb Reading	Difference	Relative Humidity	A	B	C	D
1	32°	13°		28%	29%	32%	33%
2	34°	3°		75%	80%	81%	87%
3	11°	4°		46%	51%	56%	58%
4	30°	6°		55%	56%	61%	67%
5	4°	2°		37%	43%	70%	71%
6		13°	29%	0°	12°	26°	33°
7		9°	44%	10°	15°	20°	30°
8		8°	36%	11°	15°	19°	23°
9		2°	68%	2°	12°	22°	32°
10		5°	58%	12°	19°	26°	34°
11	26°		34%	10°	11°	12°	13°
12	0°		46%	1°	2°	3°	4°
13	35°		69%	2°	3°	4°	5°
14	8°		40%	4°	5°	6°	7°
15	15°		44%	5°	6°	7°	8°

TEACHERS' NOTES

This test is designed to determine whether or not the student can use a table to obtain information.

This test has been tested on a range of students in Years 7 to 10 in New South Wales schools.

Recommended mastery score:

The final decision as to the score which indicates mastery must lie with the classroom teacher. The information below will help you to arrive at an informed decision. In this table you will find the percentages of students achieving a given score *or better*. Cumulative percentages are given for the two years in which the largest samples occur.

YEAR	NO. OF STUDENTS	S C O R E								
		≥15	≥14	≥13	≥12	≥11	≥10	≥9	≥8	<8
8	164	63%	77%	84%	87%	89%	91%	93%	96%	4%
9	123	67%	83%	92%	93%	95%	96%	97%	98%	2%

In general a student achieving a score of 12 out of 15 should be regarded as having mastered this skill.

Proper use of the scores:

This test is not designed to rank or grade students and its use for this purpose is highly undesirable. The scores obtained on this test will supply information about students who are having difficulty with the skill tested. For a more detailed analysis of these points, consult the manual which accompanies these tests.

Set scores:

Low scores on certain sets of questions may indicate specific problems as indicated below:

Questions 1-5 - Students may have problems recognising that the required information is to be found at the intersection of the co-ordinates.

Questions 6 -15 - Students may have problems extrapolating from the body of data to the axes.

General: Students may need to be directed to use a ruler in reading from the table.

Related skills for which tests have not been prepared:

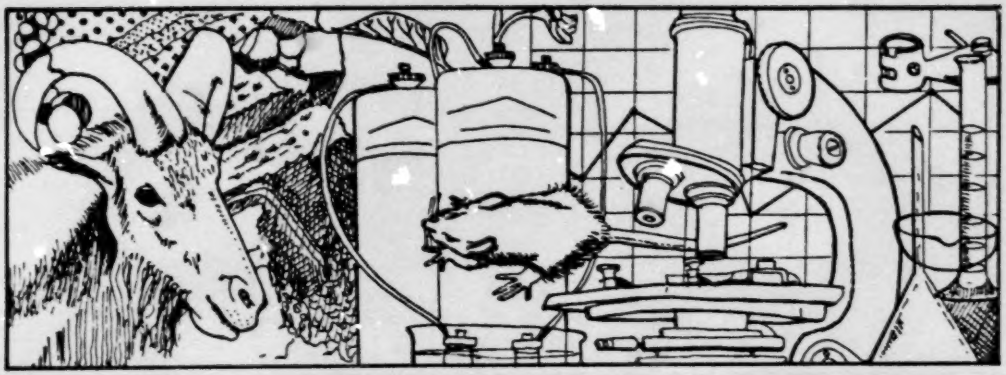
Constructing a table
Organising data into a table
Transposing information from graphs and prose to tables (and *vice versa*)
Extracting trends and sequences from tabulated information.

M 2

New South Wales **Department of Education**

SCIENCE

MASTERY TESTING PROGRAMME



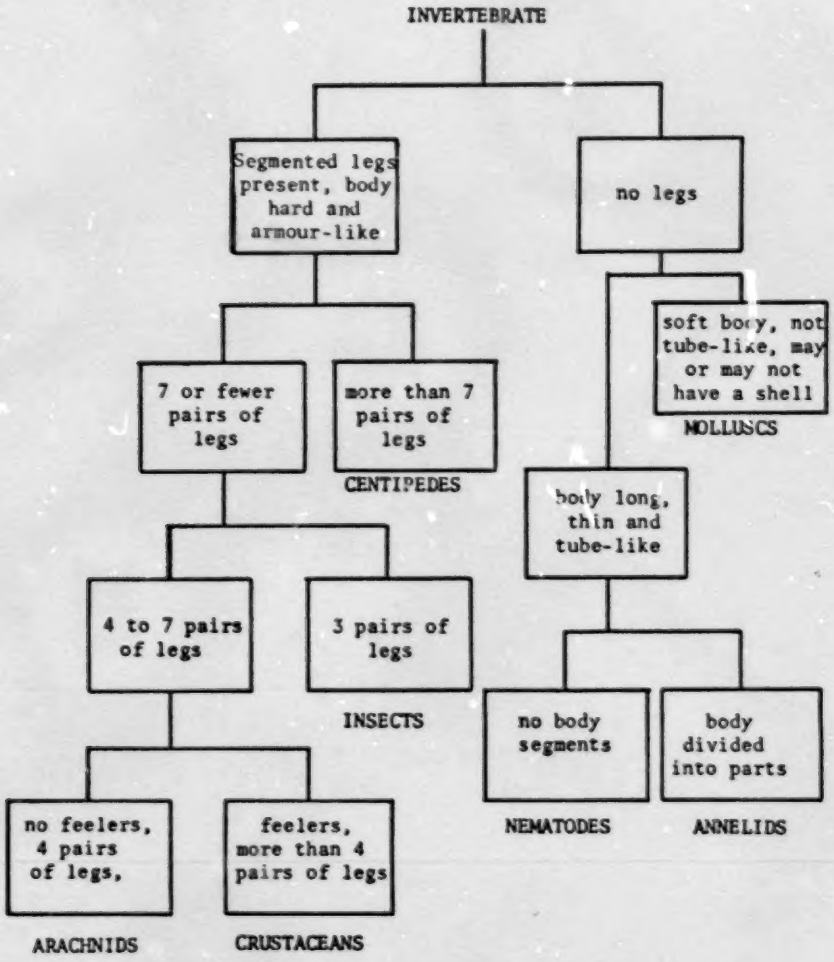
TEST M2 : A TEST FOR

TH[illegible]ALL OF

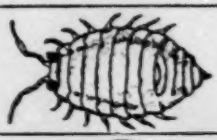
USING A BIOLOGICAL KEY

The diagram below may be used to identify the "group" in which an invertebrate belongs.

Start at "Invertebrate", and choose either the "legs" box or the "no legs" box. Then make another choice, and so on, until you have reached a box which ends in the name of a group. You have now identified your invertebrate.



For each of the pictured animals, choose the correct group from the four named. Mark its letter (A, B, C or D) on your answer sheet.

QUESTION		A	B	C	D
1		Arachnid	Centipede	Crustacean	Insect
2		Annelid	Crustacean	Mollusc	Nematode
3		Arachnid	Centipede	Crustacean	Insect
4		Centipede	Crustacean	Insect	Mollusc
5		Arachnid	Crustacean	Insect	Mollusc
6		Annelid	Insect	Mollusc	Nematode
7		Annelid	Arachnid	Mollusc	Nematode
8		Arachnid	Centipede	Crustacean	Insect
9		Annelid	Centipede	Mollusc	Nematode
10		Arachnid	Centipede	Insect	Mollusc

TEACHERS' NOTES

This test is designed to determine whether or not the student can use a classification flow diagram.

This test has been tested on a range of students in Years 7 to 10 in New South Wales schools.

Recommended mastery score:

The final decision as to the score which indicates mastery must lie with the classroom teacher. The information below will help you to arrive at an informed decision. In this table you will find the percentages of students achieving a given score *or better*. Cumulative percentages are given for the two years in which the largest samples occur.

YEAR	NO. OF STUDENTS	SCORE								
		≥10	≥ 9	≥ 8	≥7	≥6	≥5	≥4	≥3	<3
7	245	5%	18%	40%	65%	80%	90%	96%	99%	1%
10	290	18%	51%	74%	89%	96%	99%	100%	100%	0

In general a student achieving a score of 8 out of 10 should be regarded as having mastered this skill.

Proper use of the scores:

This test is not designed to rank or grade students and its use for this purpose is highly undesirable. The scores obtained on this test will supply information about students who are having difficulty with the skill tested. For a more detailed analysis of these points, consult the manual which accompanies these tests.

Set scores:

Low scores on certain sets of questions may indicate specific problems as indicated below:

Students may have a lack of familiarity with biological keys. Students may not be observing diagrams closely enough. Students may be unable to distinguish between body parts.

Related tests

Two other tests involving flow diagrams are in preparation.

Related skills for which tests have not been prepared

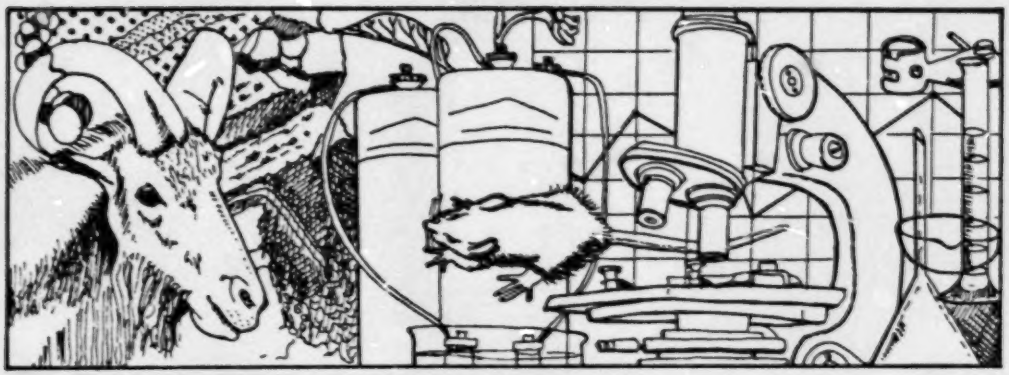
Observing specimens and noting characteristics
Drawing and labelling lines on prepared specimens accurately
Classifying actual specimens using the key
Classifying groups of things on related characteristics

M 3

New South Wales **Department of Education**

SCIENCE

MASTERY TESTING PROGRAMME



TEST M3 : A TEST FOR

THE SKILL OF

IDENTIFYING CHEMICAL SYMBOLS

Identifying chemical symbols

In this set, select the symbol which matches the element named and mark its letter (A, B, C or D) on your answer sheet.

Question		A	B	C	D
1	Hydrogen has the symbol	He	H	Hy	Hg
2	Sodium has the symbol	Na	S	So	N
3	Nitrogen has the symbol	Na	Ne	N	Ni
4	Carbon has the symbol	Ca	Cr	C	Cn
5	Chlorine has the symbol	Cl	Ch	Co	Cr
6	Calcium has the symbol	C	Cu	Cl	Ca
7	Potassium has the symbol	P	Ka	Po	K
8	Boron has the symbol	Bo	B	Bn	Br
9	Oxygen has the symbol	Oy	On	O	Ox
10	Lithium has the symbol	Li	Be	Ba	Lt

Identifying chemical symbols

In this set, select the element which matches the symbol, and mark its letter (A, B, C or D) on your answer sheet.

Question		A	B	C	D
11	Cu is the symbol for	Copper	Chromium	Calcium	Curium
12	Fe is the symbol for	Fluorine	Iron	Fermium	Iodine
13	Hg is the symbol for	Hydrogen	Helium	Mercury	Silver
14	Sn is the symbol for	Strontium	Zinc	Sodium	Tin
15	He is the symbol for	Helium	Hydrogen	Helicon	Henrium
16	Si is the symbol for	Silver	Scandium	Silicon	Selenium
17	P is the symbol for	Phosphorus	Lead	Potassium	Plutonium
18	Be is the symbol for	Berkelium	Bromine	Beryllium	Bellium
19	S is the symbol for	Sodium	Silver	Silicon	Sulphur
20	Ne is the symbol for	Neptunium	Nerium	Neon	Nitrogen

TEACHERS' NOTES

This test is designed to determine whether or not the student can identify the chemical symbols for the more common elements.

This test has been tested on a range of students in Years 7 to 10 in New South Wales schools.

Recommended mastery score:

The final decision as to the score which indicates mastery must lie with the classroom teacher. The information below will help you to arrive at an informed decision. In this table you will find the percentages of students achieving a given score *or better*. Cumulative percentages are given for the two years in which the largest samples occur.

YEAR	NO. OF STUDENTS	S C O R E								
		≥20	≥19	≥18	≥17	≥16	≥15	≥14	≥13	<13
8	217	2%	15%	33%	46%	60%	71%	78%	84%	16%
10	124	22%	33%	51%	65%	76%	81%	83%	87%	13%

In general a student achieving a score of 16 out of 20 should be regarded as having mastered this skill.

Proper use of the scores:

This test is not designed to rank or grade students and its use for this purpose is highly undesirable. The scores obtained on this test will supply information about students who are having difficulty with the skill tested. For a more detailed analysis of these points, consult the manual which accompanies these tests.

Set scores:

Low scores on certain sets of questions may indicate specific problems as indicated below:

Lack of familiarity with chemical symbols.

Related skills for which tests have not been prepared:

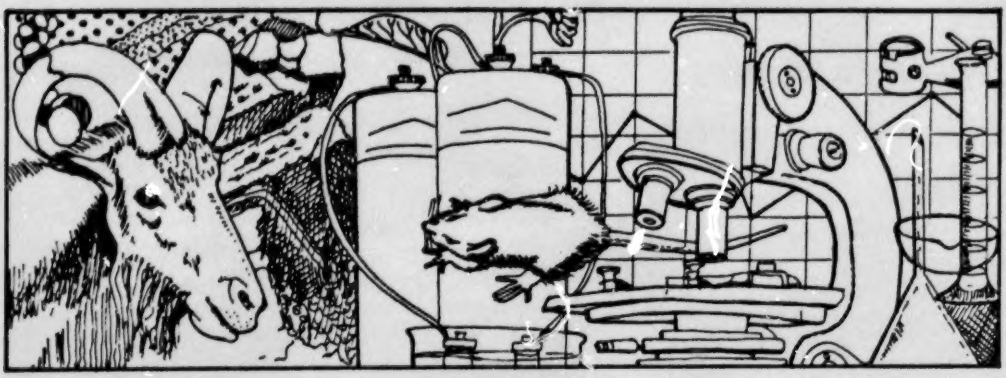
Recognising chemical formulae.

M 4

New South Wales **Department of Education**

SCIENCE

MASTERY TESTING PROGRAMME



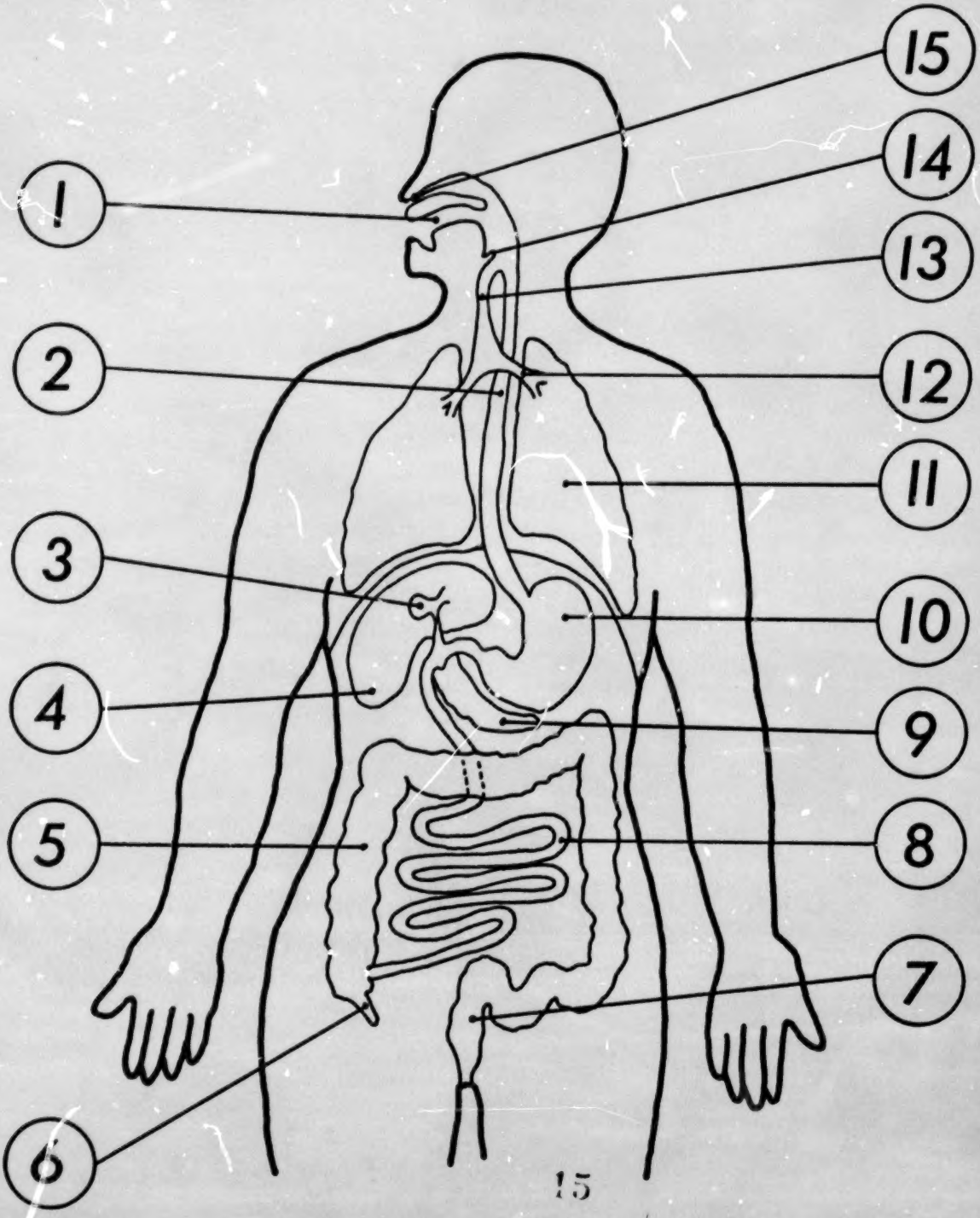
TEST M4 : A TEST FOR

THE SKILL OF

IDENTIFYING PARTS OF A HUMAN BODY

(RESPIRATORY/ALIMENTARY)

The questions in this test refer to this diagram. The numbers indicate the body part for each question.



For each item, select the correct name from the four choices, and write its letter (A, B, C or D) on your answer sheet.

QUESTION	A	B	C	D
1	tongue	larynx	mouth	throat
2	lung	oesophagus	throat	trachea
3	gall bladder	liver	pancreas	stomach
4	gall bladder	liver	pancreas	stomach
5	large intestine	rectum	small intestine	duodenum
6	appendix	colon	rectum	small intestine
7	anus	colon	large intestine	rectum
8	appendix	pancreas	small intestine	stomach
9	gall bladder	liver	pancreas	stomach
10	large intestine	liver	pancreas	stomach
11	heart	liver	lung	stomach
12	bronchus	gullet	lung	trachea
13	bronchus	gullet	oesophagus	trachea
14	epiglottis	neck	throat	tongue
15	mouth	nostril	salivary gland	tongue

TEACHERS' NOTES

This test is designed to determine whether or not the student can identify parts of the human body (alimentary/respiratory).

This test has been tested on a range of students in Years 7 to 10 in New South Wales schools.

Recommended mastery score:

The final decision as to the score which indicates mastery must lie with the classroom teacher. The information below will help you to arrive at an informed decision. In this table you will find the percentages of students achieving a given score *or better*. Cumulative percentages are given for the two years in which the largest samples occur.

YEAR	NO. OF STUDENTS	S C O R E								
		≥15	≥14	≥13	≥12	≥11	≥10	≥9	≥8	<8
9	203	1%	17%	31%	51%	61%	67%	76%	83%	17%
10	123	10%	32%	46%	58%	70%	82%	87%	94%	6%

In general a student achieving a score of 12 out of 15 should be regarded as having mastered this skill.

Proper use of the scores:

This test is not designed to rank or grade students and its use for this purpose is highly undesirable. The scores obtained on this test will supply information about students who are having difficulty with the skill tested. For a more detailed analysis of these points, consult the manual which accompanies these tests.

Set scores:

Low scores on certain sets of questions may indicate specific problems as indicated below:

Lack of familiarity with the parts mentioned
Inability to distinguish between organs

Related tests:

M9 - Identifying the bones of a human skeleton : Form A
M10 - Identifying the bones of a human skeleton : Form B
021036 - Identifying parts of the eye

Related skills for which tests have not been prepared:

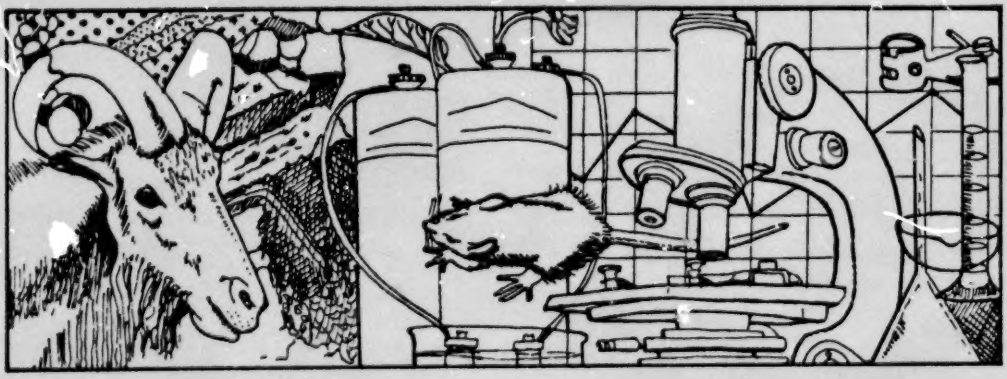
Identifying organs and parts of the human body not specified above.

M 5

New South Wales **Department of Education**

SCIENCE

MASTERY TESTING PROGRAMME

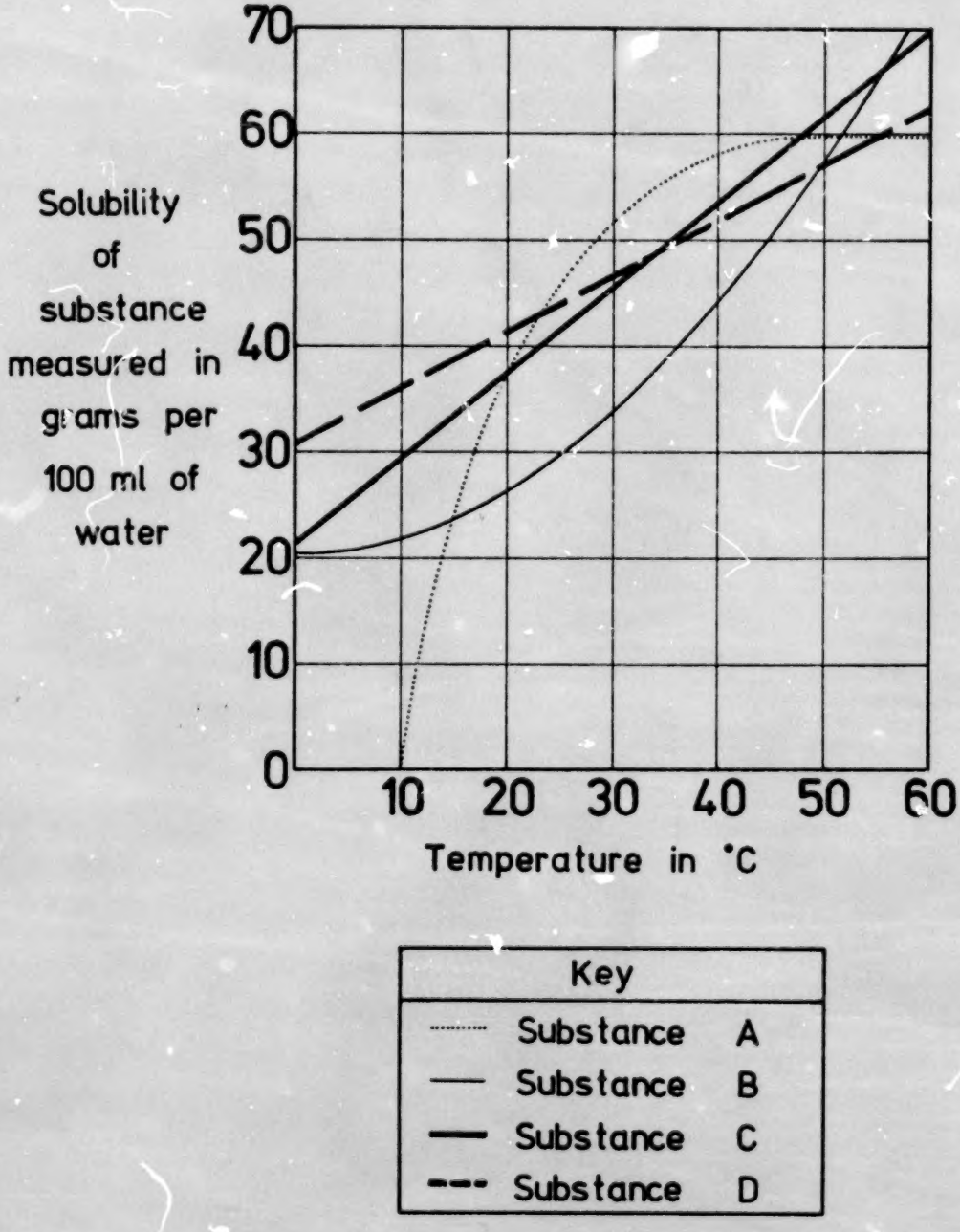


TEST M5 : A TEST FOR

THE SKILL OF

READING A LINE GRAPH

The next 15 questions refer to this graph.



SET 1

For each question, identify the substance with the highest solubility at the stated temperature. Mark its letter (A, B, C or D) on your answer sheet.

QUESTION	TEMPERATURE	ANSWER			
1	20°	A	B	C	D
2	30°	A	B	C	D
3	40°	A	B	C	D
4	50°	A	B	C	D
5	60°	A	B	C	D

SET 2

For each question, identify the substance with the lowest solubility at the stated temperature. Mark its letter (A, B, C or D) on your answer sheet.

QUESTION	TEMPERATURE	ANSWER			
6	20°	A	B	C	D
7	30°	A	B	C	D
8	40°	A	B	C	D
9	50°	A	B	C	D
10	60°	A	B	C	D

SET 3

For each question, identify the substance with the stated solubility at the stated temperature.

QUESTION	SOLUBILITY AND TEMPERATURE	ANSWER			
11	52gm/100ml at 30°C	A	B	C	D
12	28gm/100ml at 10°C	A	B	C	D
13	45gm/100ml at 40°C	A	B	C	D
14	42gm/100ml at 20°C	A	B	C	D
15	62gm/100ml at 60°C	A	B	C	D

TEACHERS' NOTES

This test is designed to determine whether or not the student can read a line graph.

This test has been tested on a range of students in Years 7 to 10 in New South Wales schools.

Recommended mastery score:

The final decision as to the score which indicates mastery must lie with the classroom teacher. The information below will help you to arrive at an informed decision. In this table you will find the percentages of students achieving a given score *or better*. Cumulative percentages are given for the two years in which the largest samples occur.

YEAR	NO. OF STUDENTS	SCORE								
		≥ 15	≥ 14	≥ 13	≥ 12	≥ 11	≥ 10	≥ 9	≥ 8	<8
9	122	52%	82%	87%	91%	95%	96%	96%	99%	1%
10	235	49%	80%	85%	89%	91%	92%	94%	94%	6%

In general a student achieving a score of 12 out of 15 should be regarded as having mastered this skill.

Proper use of the scores:

This test is not designed to rank or grade students and its use for this purpose is highly undesirable. The scores obtained on this test will supply information about students who are having difficulty with the skill tested. For a more detailed analysis of these points, consult the manual which accompanies these tests.

Set scores:

Low scores on certain sets of questions may indicate specific problems as indicated below:

Set 3: Difficulty in using co-ordinates to locate a plot point.

Related tests:

M1 - Reading a table
021022 - Reading from a grid plan
Recognising graphs from given data (in preparation)

Related skills for which tests have not been prepared:

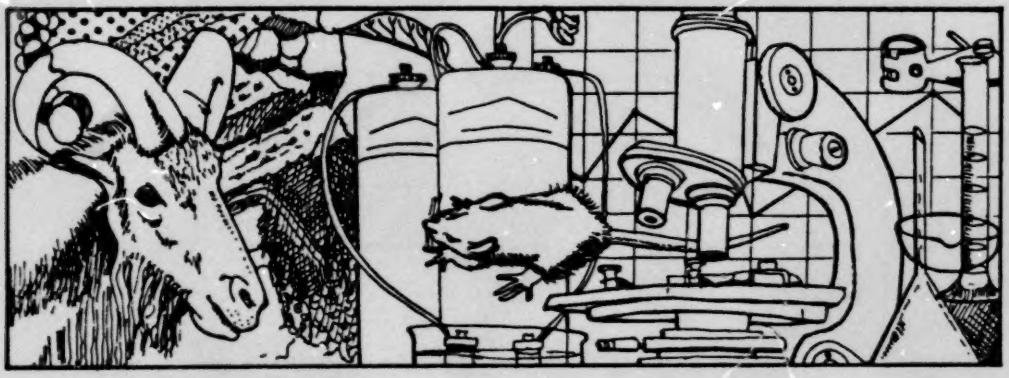
Drawing a graph
Selection of suitable axes for graphs
Construction of labelled axes for graphs.

M 6

New South Wales **Department of Education**

SCIENCE

MASTERY TESTING PROGRAMME



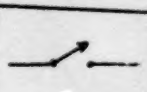
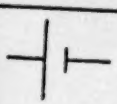
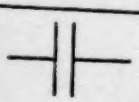
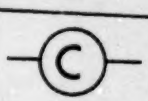
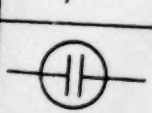
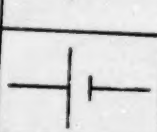
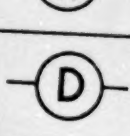
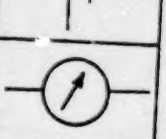
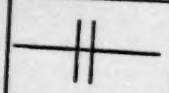
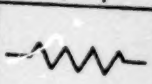
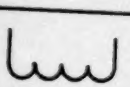
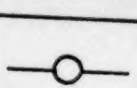
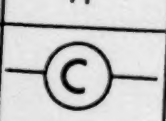
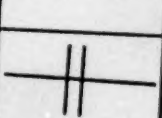
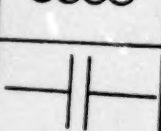
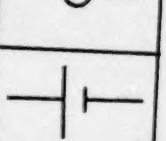
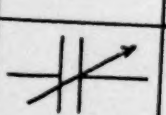
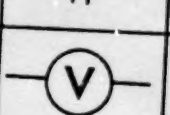
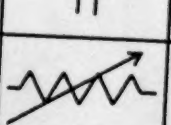
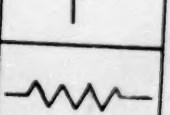
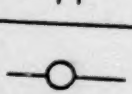
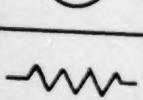
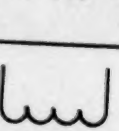
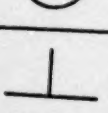
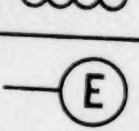
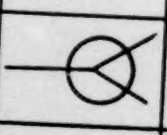
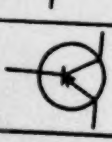
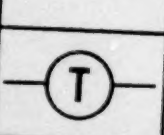
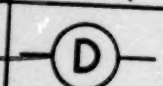
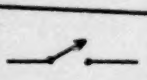
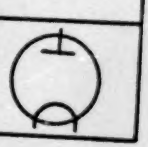
TEST M6 : A TEST FOR

THE SKILL OF

IDENTIFYING ELECTRONIC AND ELECTRICAL SYMBOLS

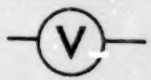
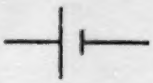
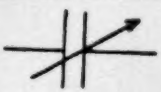
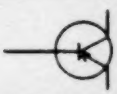
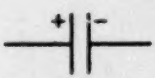
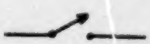
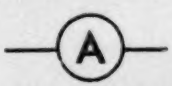
SET 1

For each of the questions, choose the symbol which matches the named electronic or electrical component. Mark its letter (A, B, C or D) on your answer sheet.

QUESTION	COMPONENT	ANSWER			
		A	B	C	D
1	Switch				
2	Cell				
3	Diode (Germanium type)				
4	Fixed resistor				
5	Capacitor				
6	Variable resistor				
7	Coil				
8	Earth				
9	Transistor				
10	Diode valve				

SET 2

For each of the questions, choose the name which matches the symbol which is shown. Mark its letter (A, B, C or D) on your answer sheet.

QUESTION	SYMBOL	ANSWERS			
		A	B	C	D
11		variable resistor	varying current	voltage source	voltmeter
12		battery	capacitor	cell	switch
13		double coil	transformer	tuned circuit	voltage supply
14		meter	rheostat	variable capacitor	variable voltage
15		thyristor	transformer	transistor	transmitter
16		electrolytic capacitor	polarised battery	polarised cell	direct current switch
17		integrated circuit	lamp	loudspeaker	transistor
18		diode	switch	variable resistor	variable voltage
19		diode	switch	variable capacitor	variable voltage
20		alternating current	ammeter	arc lamp	audion valve

TEACHERS' NOTES

This test is designed to determine whether or not the student can identify electrical and electronic symbols.

This test has been tested on a range of students in Year 10 in New South Wales schools.

Recommended mastery score:

The final decision as to the score which indicates mastery must lie with the classroom teacher. The information below will help you to arrive at an informed decision. In this table you will find the percentages of students achieving a given score *or better*. Cumulative percentages are given for the two years in which the largest samples occur.

YEAR	NO. OF STUDENTS	SCORE								
		≥ 20	≥ 18	≥ 16	≥ 14	≥ 12	≥ 11	≥ 10	≥ 9	<9
		ONLY	YEAR	TEN	WAS	INVOLVED		IN	TRIALS	
10	98	2	13	23	31	52	68	76	87	13

In general a student achieving a score of 16 out of 20 should be regarded as having mastered this skill.

Proper use of the scores:

This test is not designed to rank or grade students and its use for this purpose is highly undesirable. The scores obtained on this test will supply information about students who are having difficulty with the skill tested. For a more detailed analysis of these points, consult the manual which accompanies these tests.

Set scores:

Low scores on certain sets of questions may indicate specific problems as indicated below:

Lack of familiarity with the symbols used.

Related skills for which tests have not been prepared:

Identifying symbols in a circuit system.

Drawing circuits using these symbols.

Construct circuit from circuit diagram.

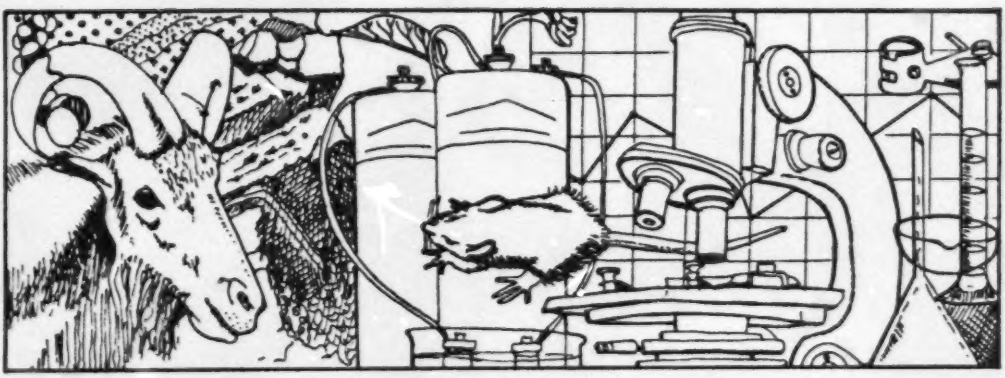
Drawing circuit diagram from a circuit.

M 7

New South Wales **Department of Education**

SCIENCE

MASTERY TESTING PROGRAMME

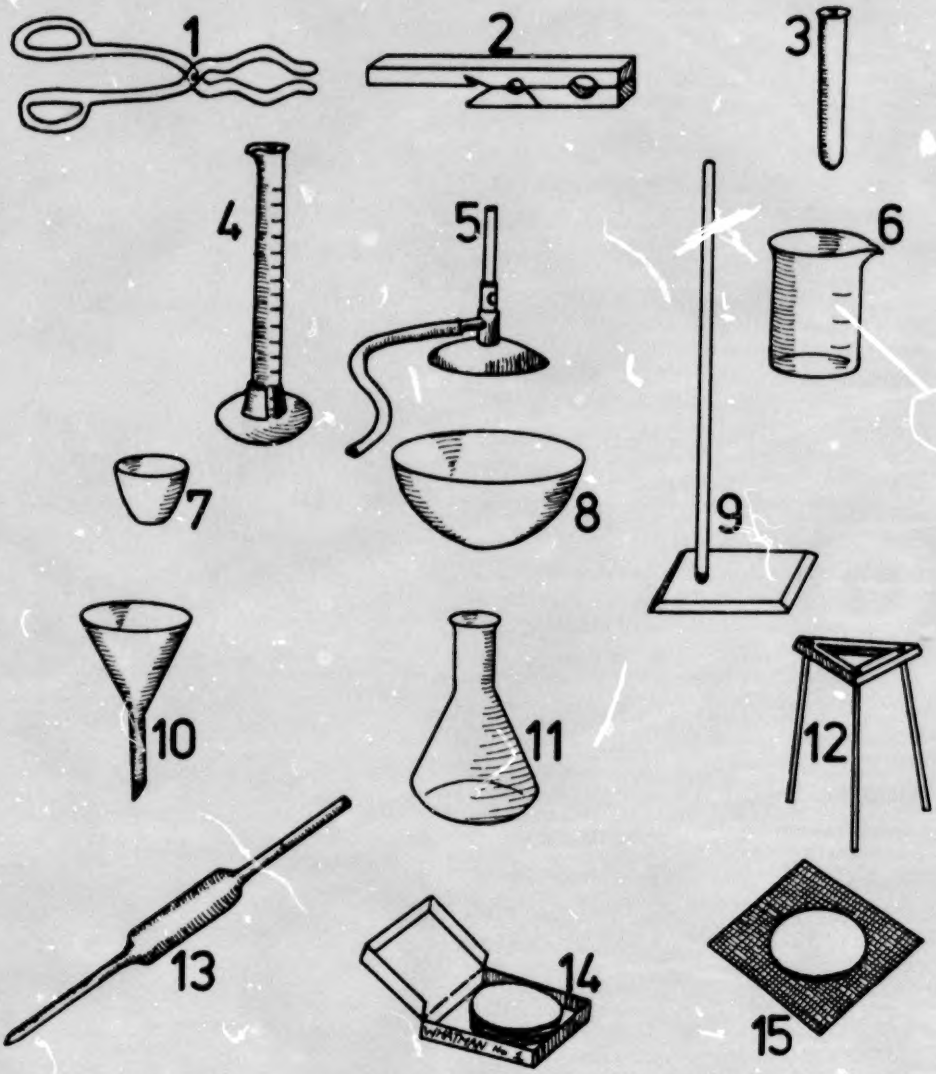


TEST M7 : A TEST FOR

THE SKILL OF

NAMING LABORATORY APPARATUS

The questions on Page 3 refer to these diagrams.



The questions below refer to the pictures of common laboratory apparatus shown opposite. These have NOT been drawn to scale. In each case,the question refers to the item with the same number. Choose the name which you think fits the item, and write its letter (A, B, C or D) on your answer sheet.

QUESTION	ANSWERS			
	A	B	C	D
1	Crucible tongs	Forceps	Test-tube holder	Tweezers
2	Crucible tongs	Forceps	Test-tube holder	Tweezers
3	Beaker	Bunsen burner	Measuring cylinder	Test tube
4	Beaker	Bunsen burner	Measuring cylinder	Test tube
5	Bunsen Burner	Measuring cylinder	Retort stand	Spirit lamp
6	Beaker	Conical flask	Gas jar	Test tube
7	Beaker	Crucible	Evaporating basin	Petri dish
8	Beaker	Crucible	Evaporating basin	Petri dish
9	Boss head	Bunsen burner	Retort stand	Tripod
10	Conical flask	Filter funnel	Measuring cone	Thistle funnel
11	Conical flask	Filter funnel	Retort	Test tube
12	Asbestos stand	Gauze	Retort stand	Tripod
13	Air blower	Burette	Measuring cylinder	Pipette
14	Filter paper	Litmus paper	Taper	Test paper
15	Asbestos mat	Filter	Gauze	Tripod

TEACHERS' NOTES

This test is designed to determine whether or not the student can name laboratory apparatus.

This test has been tested on a range of students in Years 7 to 10 in New South Wales schools.

Recommended mastery score:

The final decision as to the score which indicates mastery must lie with the classroom teacher. The information below will help you to arrive at an informed decision. In this table you will find the percentages of students achieving a given score *or better*. Cumulative percentages are given for the two years in which the largest samples occur.

YEAR	NO. OF STUDENTS	SCORE								
		≥15	≥14	≥13	≥12	≥11	≥10	≥9	≥8	<8
7	433	23	44	65	84	92	96	98	99	1
10	283	16	39	60	78	91	95	98	99	1

In general a student achieving a score of 12 out of 15 should be regarded as having mastered this skill.

Proper use of the scores:

This test is not designed to rank or grade students and its use for this purpose is highly undesirable. The scores obtained on this test will supply information about students who are having difficulty with the skill tested. For a more detailed analysis of these points, consult the manual which accompanies these tests.

Related tests:

Identifying laboratory apparatus.(M8)

Related skills for which tests have not been prepared:

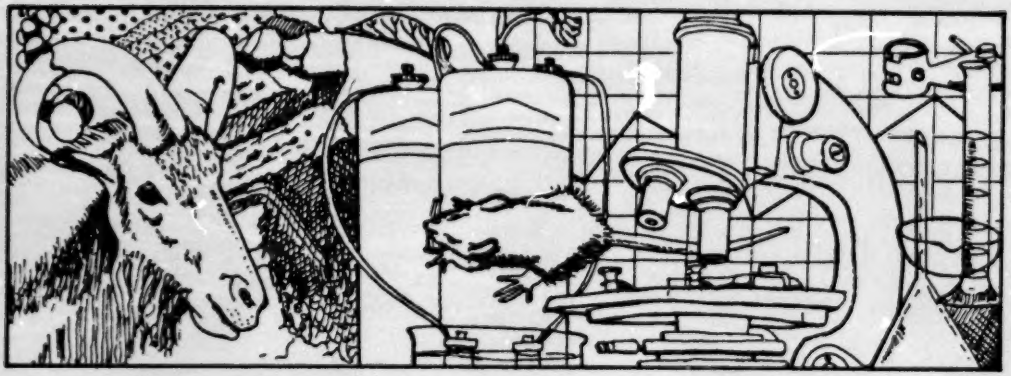
Using laboratory apparatus.

M 8

New South Wales **Department of Education**

SCIENCE

MASTERY TESTING PROGRAMME

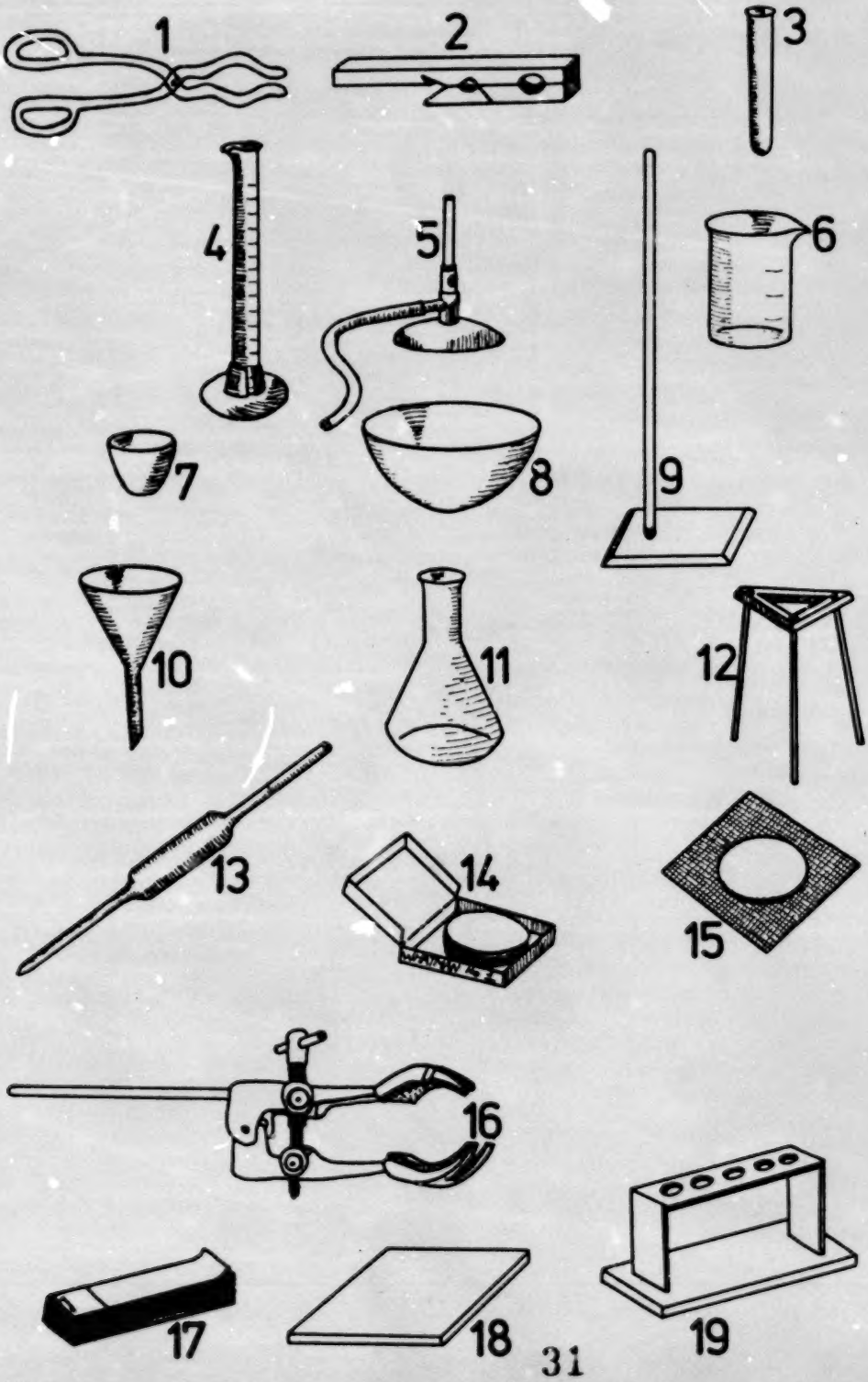


TEST M8 : A TEST FOR

THE SKILL OF

IDENTIFYING LABORATORY APPARATUS

The questions on Page 3 refer to these diagrams.



The questions below refer to the pictures of common laboratory apparatus shown opposite. These have NOT been drawn to scale. In each case, choose the item from those offered which you think matches the name. Write its letter (A, B, C or D) on your answer sheet.

QUESTION	NAME	ANSWERS			
		A	B	C	D
1	Beaker	3	6	7	8
2	Bunsen burner	3	4	5	9
3	Conical flask	4	6	10	11
4	Crucible	3	6	7	8
5	Crucible tongs	1	2	9	16
6	Evaporating basin	6	7	8	11
7	Filter funnel	10	11	13	14
8	Filter paper	10	14	15	17
9	Gauze	12	14	15	18
10	Measuring cylinder	3	4	11	13
11	Pipette	3	4	11	13
12	Retort stand	1	9	12	16
13	Test tube	3	4	6	7
14	Test tube holder	1	2	16	19
15	Tripod	12	15	16	19

TEACHERS' NOTES

This test is designed to determine whether or not the student can identify laboratory apparatus.

This test has been tested on a range of students in Years 7 to 10 in New South Wales schools.

Recommended mastery score:

The final decision as to the score which indicates mastery must lie with the classroom teacher. The information below will help you to arrive at an informed decision. In this table you will find the percentages of students achieving a given score *or better*. Cumulative percentages are given for the two years in which the largest samples occur.

YEAR	NO. OF STUDENTS	S C O R E								
		≥15	≥14	≥13	≥12	≥11	≥10	≥9	≥8	<8
7	340	31	56	78	89	93	95	97	97	3
8	139	16	56	77	86	94	96	97	97	3

N.B. minor fluctuations may occur as a result of sampling error.

In general a student achieving a score of 12 out of 15 should be regarded as having mastered this skill.

Proper use of the scores:

This test is not designed to rank or grade students and its use for this purpose is highly undesirable. The scores obtained on this test will supply information about students who are having difficulty with the skill tested. For a more detailed analysis of these points, consult the manual which accompanies these tests.

Set scores:

Low scores on certain sets of questions may indicate specific problems as indicated below:

Related tests:

Naming laboratory apparatus.(M7)

Related skills for which tests have not been prepared:

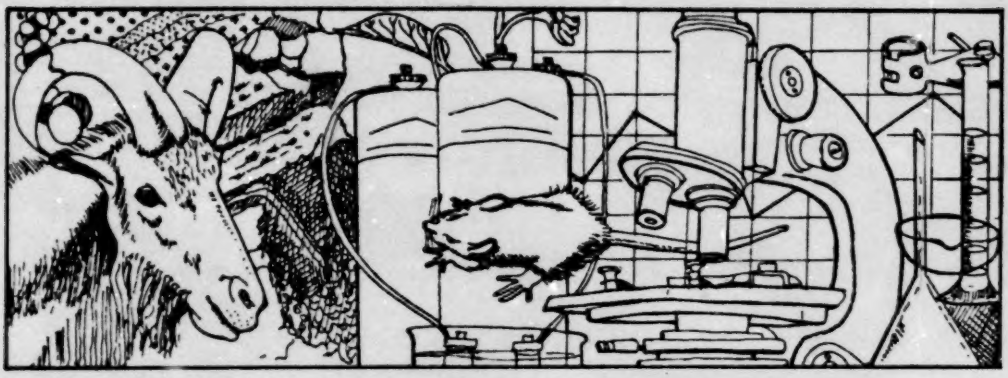
Using laboratory apparatus.

M 9

New South Wales **Department of Education**

SCIENCE

MASTERY TESTING PROGRAMME



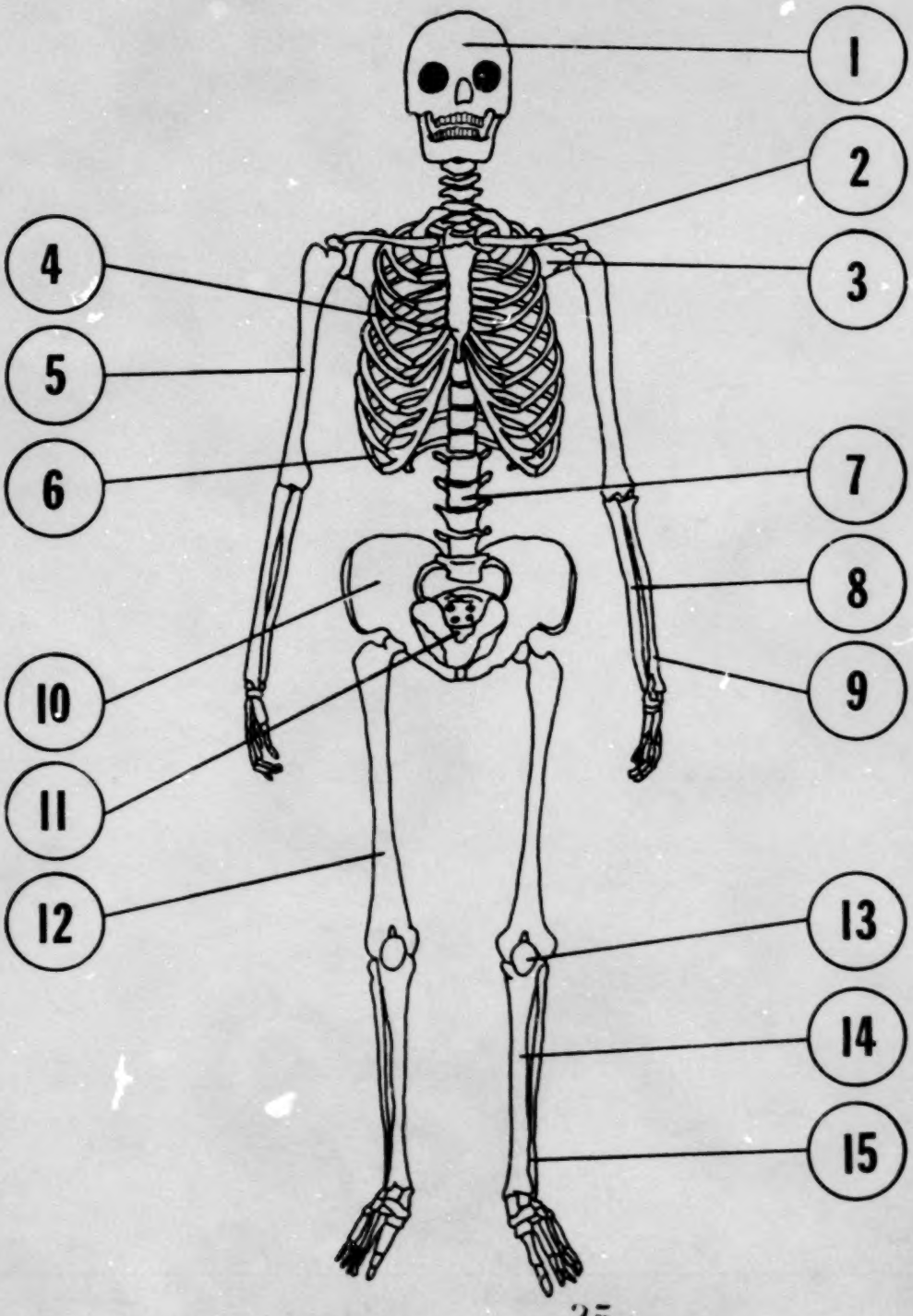
TEST M9 : A TEST FOR

THE SKILL OF

IDENTIFYING THE BONES OF THE HUMAN SKELETON

(FORM A : TECHNICAL NAMES)

The diagram on this page is to be used in answering the questions opposite.



For each of the numbered bones in the skeleton opposite, select the correct name and write its letter (A, B, C or D) on your answer sheet.

QUESTION	ANSWERS			
	A	B	C	D
1	Cerebellum	Cerebrum	Cranium	Scapula
2	Axis	Clavicle	Humerus	Scapula
3	Atlas	Clavicle	Rib	Scapula
4	Diaphragm	Rib	Sternum	Thorax
5	Biceps	Humerus	Radius	Ulna
6	Rib	Sternum	Thorax	Vertebra
7	Atlas	Coccyx	Pelvis	Vertebra
8	Carpal	Humerus	Radius	Ulna
9	Humerus	Metacarpal	Radius	Ulna
10	Coccyx	Pelvis	Phalanges	Posterium
11	Abdomen	Coccyx	Femur	Pelvis
12	Femur	Fibula	Patella	Tarsal
13	Femur	Metatarsal	Patella	Tibia
14	Fibula	Patella	Tarsal	Tibia
15	Fibula	Metatarsal	Tarsal	Tibia

TEACHERS' NOTES

This test is designed to determine whether or not the student can supply technical names for the bones of the human skeleton.

This test has been tested on a range of students in Years 7 to 10 in New South Wales schools.

Recommended mastery score:

The final decision as to the score which indicates mastery must lie with the classroom teacher. The information below will help you to arrive at an informed decision. In this table you will find the percentages of students achieving a given score *or better*. Cumulative percentages are given for the two years in which the largest samples occur.

YEAR	NO. OF STUDENTS	S C O R E								
		≥15	≥14	≥13	≥12	≥11	≥10	≥9	≥8	<8
9	62	63%	66%	89%	92%	92%	92%	92%	92%	8%
10	8	1%	1%	18%	26%	40%	52%	61%	72%	28%

N.B. Each sample consists of two classes. No control was placed on prior experience or level of ability.
In general a student achieving a score of 12 out of 15 should be regarded as having mastered this skill.

Proper use of the scores:

This test is not designed to rank or grade students and its use for this purpose is highly undesirable. The scores obtained on this test will supply information about students who are having difficulty with the skill tested. For a more detailed analysis of these points, consult the manual which accompanies these tests.

Related tests:

M10: Identifying bones of the human skeleton (common names).

Related skills for which tests have not been prepared:

Recognising *actual* bones.

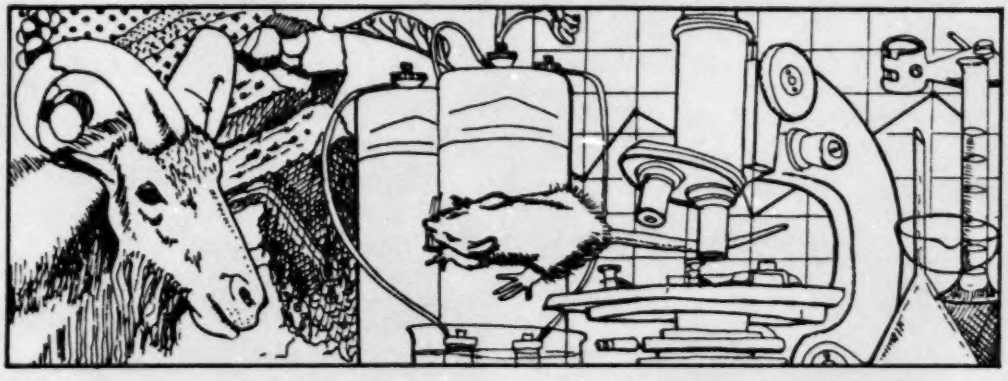
Identifying *functions* of bones.

M 10

New South Wales **Department of Education**

SCIENCE

MASTERY TESTING PROGRAMME



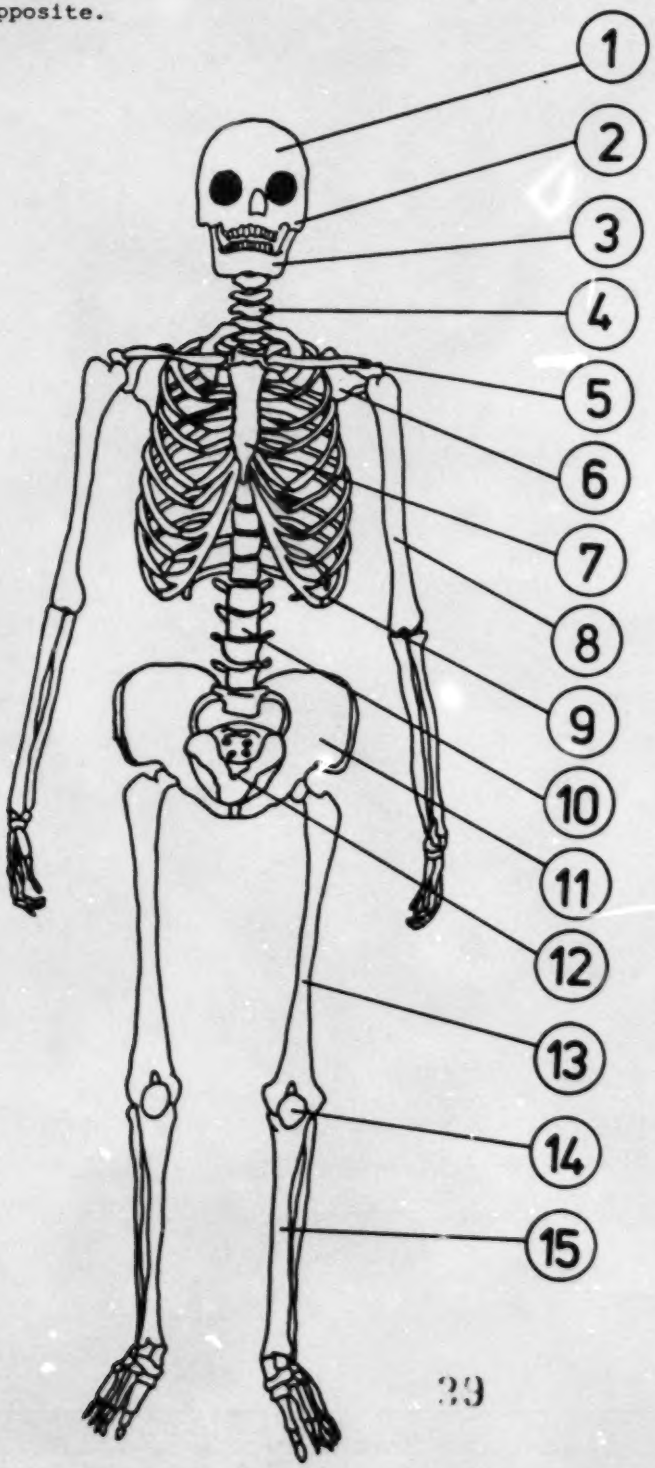
TEST M10 : A TEST FOR

THE SKILL OF

IDENTIFYING THE BONES OF A HUMAN SKELETON

(FORM B : COMMON NAMES)

This test measures your abilit/ to give the common names of bones in the human skeleton. The diagram on this page is to be used in answering the questions opposite.



For each of the numbered bones in the skeleton opposite, select the correct common name and mark its letter (A, B, C or D) on your answer sheet.

QUESTION	ANSWERS			
	A	B	C	D
1	skull	head	forehead	scalp
2	jaw bone	face bone	cheek bone	nose bone
3	chin	jaw bone	face bone	palate
4	windpipe	collar bone	tracheal bone	neck bone
5	shoulder bone	rib cage	breast plate	collar bone
6	back bone	shoulder blade	collar blade	rib bone
7	breast bone	chest bone	frontal bone	rib cage
8	upper arm bone	funny bone	shoulder bone	elbow
9	breast bone	chest bone	rib bone	spine bone
10	tail bone	spinal cord	mid bone	back bone
11	leg bone	back bone	hip bone	tail bone
12	tail bone	hip bone	rectal bone	caudal bone
13	leg bone	thigh bone	hip bone	knee bone
14	knee cap	thigh plate	ankle cap	shin plate
15	ankle bone	knee bone	hip bone	shin bone

TEACHERS' NOTES

This test is designed to determine whether or not the student can supply common names for bones of the human skeleton.

This test has been tested on a range of students in Years 7 to 10 in New South Wales schools.

Recommended mastery score:

The final decision as to the score which indicates mastery must lie with the classroom teacher. The information below will help you to arrive at an informed decision. In this table you will find the percentages of students achieving a given score *or better*. Cumulative percentages are given for the two years in which the largest samples occur.

YEAR	NO. OF STUDENTS	SCORE								
		≥15	≥14	≥13	≥12	≥11	≥10	≥9	≥8	<8
9	252	2%	15%	36%	56%	73%	82%	91%	96%	4%
10	152	1%	12%	28%	37%	55%	70%	23%	83%	17%

N.B. Apparent inconsistencies may be attributed to small samples.

In general a student achieving a score of 12 out of 15 should be regarded as having mastered this skill.

Proper use of the scores:

This test is not designed to rank or grade students and its use for this purpose is highly undesirable. The scores obtained on this test will supply information about students who are having difficulty with the skill tested. For a more detailed analysis of these points, consult the manual which accompanies these tests.

A low score may indicate unfamiliarity with some of the common names used : for some students, Form A may be more relevant. For other students, a combination of the two Forms may be most effective.

Related tests:

M9 : Identifying bones of the human skeleton, Form A : technical names.

Identifying parts of the human body. (alimentary/respiratory).(M4)

Related skills for which tests have not been prepared:

Recognising *actual* bones.

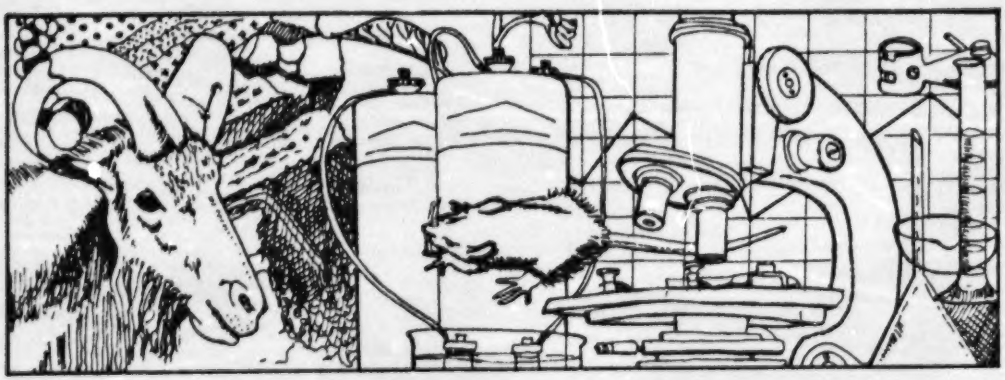
Identifying *functions* of bones.

M 11

New South Wales **Department of Education**

SCIENCE

MASTERY TESTING PROGRAMME



TEST M11 : A TEST FOR

THE SKILL OF

NAMING THE BRANCHES OF SCIENCE

This test is designed to test your ability to give names to the different branches of Science.

SET 1

In the next five questions, statements by famous scientists are listed with four branches of science in which they may have worked. Choose the branch of Science which best fits the work described in the statement, and write its letter (A, B, C or D) on your answer sheet.

Question	Quotation	Branch of Science			
		A	B	C	D
1	Galileo Galilei: "From my observations, Jupiter has several moons."	ASTRONOMY	METEOROLOGY	GEOLOGY	PHYSICS
2	William Harvey: "My work leads men to believe that the blood flows around the body."	BIOLOGY	CHEMISTRY	GEOLOGY	PHYSICS
3	Marie Curie: "From several tonnes of pitch-blende I separated out a small amount of a new substance which I called radium."	ASTRONOMY	BIOLOGY	CHEMISTRY	GEOLOGY
4	Michael Faraday: "You can produce electricity using a magnet and a coil of wire."	ASTRONOMY	BIOLOGY	CHEMISTRY	PHYSICS
5	Antoine Lavoisier: "When we burn something, part of the air is used up."	ASTRONOMY	BIOLOGY	CHEMISTRY	PHYSICS

SET 2

In the next five questions, a scientific activity is listed with the names of four branches of science. Choose the branch which best fits the activity, and write its letter (A, B, C or D) on your answer sheet.

Question	Activity	Branches of Science			
		A	B	C	D
6	Investigating the use of solar energy.	ASTRONOMY	BIOLOGY	GEOLOGY	PHYSICS
7	Classifying animals.	BIOLOGY	CHEMISTRY	GEOLOGY	PHYSICS
8	Observing craters on a moon, from the Earth	ASTRONOMY	BIOLOGY	GEOLOGY	PHYSICS
9	Working out how mountains are made.	ASTRONOMY	BIOLOGY	CHEMISTRY	GEOLOGY
10	Separating salt from seawater.	ASTRONOMY	CHEMISTRY	GEOLOGY	PHYSICS

SET 3

In the next five questions a scientist's statement about water is listed with the names of four types of scientist. Choose the type of scientist most likely to make the statement and write the letter of your answer (A, B, C or D) on your answer sheet.

Question	Statement about water	Types of Scientist			
		A	B	C	D
11	"The rings of Saturn are made of ice and dust."	ASTRONOMER	BIOLOGIST	CHEMIST	GEOLOGIST
12	"Valleys are formed by the action of moving water."	BIOLOGIST	CHEMIST	GEOLOGIST	PHYSICIST
13	"Pure water at sea level boils at 100°C."	ASTRONOMER	BIOLOGIST	GEOLOGIST	PHYSICIST
14	"87.3% of a human body is water."	ASTRONOMER	BIOLOGIST	GEOLOGIST	PHYSICIST
15	"The formula for water is H_2O."	ASTRONOMER	BIOLOGIST	CHEMIST	PHYSICIST

TEACHERS' NOTES

This test is designed to determine whether or not the student can identify the work carried out in the basic branches of science.

This test has been tested on a range of students in Years 7 to 10 in New South Wales schools.

Recommended mastery score:

The final decision as to the score which indicates mastery must lie with the classroom teacher. The information below will help you to arrive at an informed decision. In this table you will find the percentages of students achieving a given score *or better*. Cumulative percentages are given for the two years in which the largest samples occur.

YEAR	NO. OF STUDENTS	S C O R E								
		⩾15	⩾14	⩾13	⩾12	⩾11	⩾10	⩾9	⩾8	<8
7	143	5%	14%	23%	29%	36%	48%	67%	81%	19%
10	248	3%	29%	52%	71%	80%	87%	92%	95%	5%

In general a student achieving a score of 12 out of 15 should be regarded as having mastered this skill.

Proper use of the scores:

This test is not designed to rank or grade students and its use for this purpose is highly undesirable. The scores obtained on this test will supply information about students who are having difficulty with the skill tested. For a more detailed analysis of these points, consult the manual which accompanies these tests.

Set scores:

Low scores on certain sets of questions may indicate specific problems as indicated below:

Set 1 failure to recognise the type of work associated with the branches of science.

Set 2 failure to recognise the range of activities of the various branches of science.

Set 3 Inability to classify a scientific problem.

Related tests:

M15 : Scientific method.

M26 : Experimental design.

Related skills for which tests have not been prepared:

Listing activities which belong to the various branches.

Identifying ways in which the branches of science are interwoven.

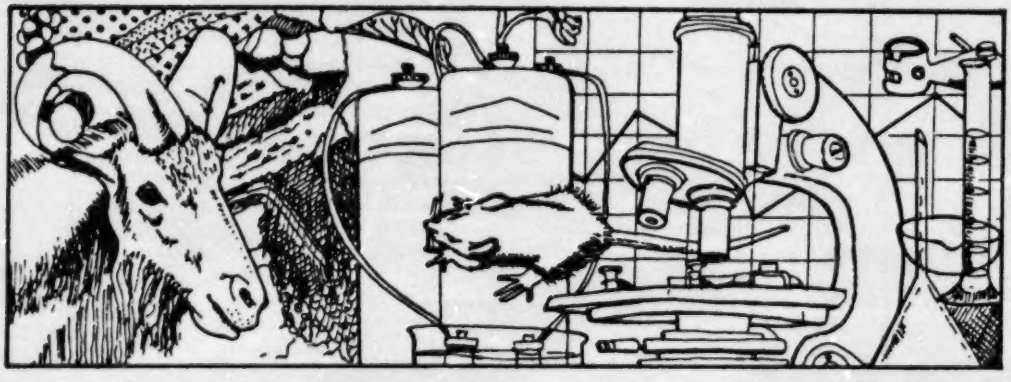
Identifying the underlying themes of science.

M 12

New South Wales **Department of Education**

SCIENCE

MASTERY TESTING PROGRAMME



TEST M12 : A TEST FOR

THE SKILL OF

CONVERTING METRIC MASS (kg AND g)

This test measures the student's mastery of the skill of converting grams to kilograms and *vice-versa*.

SET 1

The next ten questions involve conversions from *grams* to *kilograms*. In each case, choose the correct answer from those given, and mark its letter (A, B, C or D) on your answer sheet.

Question	Mass in Grams	ANSWER IN KILOGRAMS			
		A	B	C	D
1	1	0.001	0.01	0.1	10
2	8	0.008	0.08	0.8	80
3	20	0.002	0.02	0.2	200
4	79	0.008	0.079	0.79	790
5	350	0.35	3.5	35	3 500
6	892	0.892	8.92	89.2	8 920
7	4 690	0.046	0.469	4.69	46.9
8	9 298	0.93	9.298	92.98	929.8
9	50 000	0.05	0.5	5	50
10	62 410	0.624	6.241	62.410	624.1

SET 2

The next ten questions involve conversions from *kilograms* to *grams*. In each case, choose the correct answer from those given, and mark its letter (A, B, C or D) on your answer sheet.

Question	Mass in Kilograms	ANSWER IN GRAMS			
		A	B	C	D
11	0.5	0.5	50	500	5 000
12	0.82	820	8 200	82 000	820 000
13	2.2	22	220	2 200	22 000
14	6.24	624	6 240	62 400	624 000
15	10.9	1.09	109	1 900	10 900
16	81.48	814.8	8 148	81 480	814 800
17	104	104 000	140 000	100 400	1 040 000
18	163.2	16 320	163 200	1 632 000	16 320 000
19	1 000	1	100	10 000	1 000 000
20	7 091.8	7.092	709.18	709 180	7 091 800

TEACHERS' NOTES

This test is designed to determine whether or not the student can convert grams into kilograms; and kilograms back to grams.

This test has been tested on a range of students in Years 7 to 10 in New South Wales schools.

Recommended mastery score:

The final decision as to the score which indicates mastery must lie with the classroom teacher. The information below will help you to arrive at an informed decision. In this table you will find the percentages of students achieving a given score *or better*. Cumulative percentages are given for the two years in which the largest samples occur.

YEAR	NO. OF STUDENTS	S C O R E								
		≥20	≥18	≥16	≥15	≥14	≥13	≥12	≥11	<11
8	92	36%	70%	78%	83%	87%	89%	93%	96%	4%
10	265	42%	58%	66%	70%	72%	74%	78%	82%	18%

In general a student achieving a score of 16 out of 20 should be regarded as having mastered this skill.

Proper use of the scores:

This test is not designed to rank or grade students and its use for this purpose is highly undesirable. The scores obtained on this test will supply information about students who are having difficulty with the skill tested. For a more detailed analysis of these points, consult the manual which accompanies these tests.

Set scores:

Low scores on certain sets of questions may indicate specific problems as indicated below:

For both sets - 1. students do not understand the magnitude indicated by the prefix "kilo".

2. students cannot manipulate decimal points.

Related tests:

021015 Converting metric length (trial edition)

021017 Converting metric volume (trial edition)

Related skills for which tests have not been prepared:

Estimating mass.

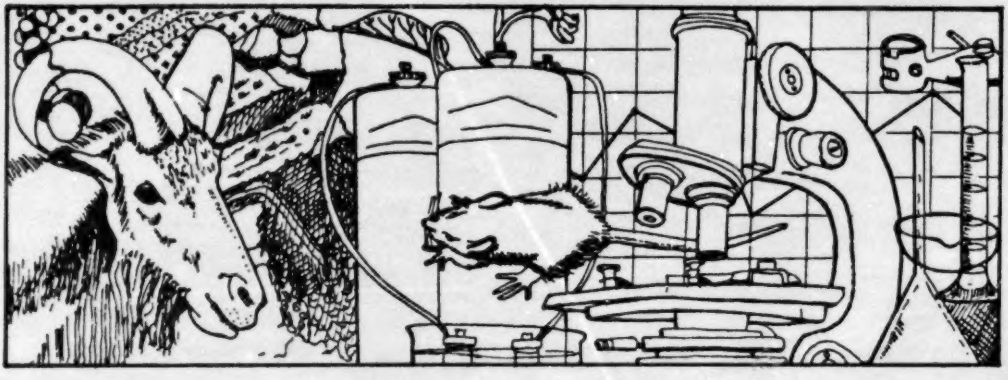
Determining the mass of objects.

M 13

New South Wales **Department of Education**

SCIENCE

MASTERY TESTING PROGRAMME



TEST M13 : A TEST FOR

THE SKILL OF

IDENTIFYING HAZARDS IN A LABORATORY

M13/2

This test is designed to test your ability to identify dangerous situations in the laboratory. For each question, find the number which is *closest* to the hazard which is named. Find the letter which matches that number and mark the letter (A, B, C or D) on your answer sheet.

QUESTION	HAZARD	ANSWERS			
		A	B	C	D
1	Someone could slip on the spilt liquid on the floor.	2	6	12	14
2	Someone could burn her hair or clothing by being too close to a lighted bunsen burner.	6	7	9	11
3	Boxes are blocking the way to a door.	8	9	10	11
4	Glassware is too close to the edge of the table and could fall and break.	5	9	11	12
5	A person could electrocute himself by using a metal screwdriver to work on a mains socket.	10	11	13	14

QUESTION	HAZARD	ANSWERS			
		A	B	C	D
6	By not watching where both hands are a person is going to burn a hand by touching a hot metal tripod.	1	5	7	11
7	Children could be injured by standing to close to a demonstration.	7	9	10	13
8	By not watching where he is going a person may knock something over or injure someone.	2	4	5	10
9	A test tube is being heated with too much liquid in it, and is aimed at a person.	6	9	11	12
10	Poisons and chemicals are kept near bottles with labels of food on them which could be taken by someone who was not careful.	1	2	10	14

TEACHERS' NOTES

This test is designed to determine whether or not the student can identify dangerous situations in a laboratory.

This test has been tested on a range of students in Years 7 to 10 in New South Wales schools.

Recommended mastery score:

The final decision as to the score which indicates mastery must lie with the classroom teacher. The information below will help you to arrive at an informed decision. In this table you will find the percentages of students achieving a given score *or better*. Cumulative percentages are given for the two years in which the largest samples occur.

YEAR	NO. OF STUDENTS	SCORE								
		≥10	≥9	≥8	≥7	≥6	≥5	≥4	≥3	<3
7	248	70%	88%	96%	98%	98%	98%	98%	99%	1%
10	145	77%	92%	100%	100%	100%	100%	100%	100%	0

In general a student achieving a score of 8 out of 10 should be regarded as having mastered this skill.

Proper use of the scores:

This test is not designed to rank or grade students and its use for this purpose is highly undesirable. The scores obtained on this test will supply information about students who are having difficulty with the skill tested. For a more detailed analysis of these points, consult the manual which accompanies these tests.

Set scores:

Low scores on certain sets of questions may indicate specific problems as indicated below:

Inability to extract information from the diagram.

Related tests:

021067 - Naming laboratory hazards (in preparation).

Free response test:

Detecting laboratory dangers.

Related skills for which tests have not been prepared:

LISTING hazards which may occur in a laboratory
PERFORMING practical work safely.